

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Andrew THOMAS,)
 et al.)
Serial No.: Not yet assigned)
Filed: Concurrently herewith) Our Ref: B-4408 619358-4
For: "ENABLING VOICE CONTROL OF)
VOICE-CONTROLLED APPARATUS") Date: December 4, 2001



CLAIM TO PRIORITY UNDER 35 U.S.C. 119

Commissioner of Patents and Trademarks
Box New Patent Application
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Sir:

- [X] Applicants hereby make a right of priority claim under 35 U.S.C. 119 for the benefit of the filing date(s) of the following corresponding foreign application(s):

<u>COUNTRY</u>	<u>FILING DATE</u>	<u>SERIAL NUMBER</u>
Great Britain	5 December 2000	0029573.3

- [] A certified copy of each of the above-noted patent applications was filed with the Parent Application No. _____.
- [X] To support applicants' claim, a certified copy of the above-identified foreign patent application is enclosed herewith.
- [] The priority document will be forwarded to the Patent Office when required or prior to issuance.

Respectfully submitted,

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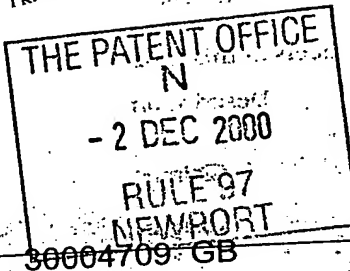
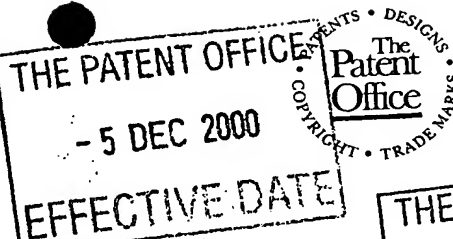
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Patents ADP number (if you know it)

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Delaware, USA

0029573.3

4. Title of the invention **Activation of voice-controlled apparatus**

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Robert F. Squibbs
Hewlett-Packard Ltd, IP Section
Filton Road
Stoke Gifford
Bristol BS34 8QZ

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country Priority application number (if you know it) Date of filing (day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

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8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

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Continuation sheets of this form

Description

5

Claim(s)

2

Abstract

1

Drawing(s)

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

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I/We request the grant of a patent on the basis of this application.

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T. F. Squibbs

Date

4 December 2000

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K Nommeots-Nomm

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Activation of Voice-Controlled Apparatus

J1017 U.S. PTO
10/005375
12/04/01

Field of the Invention

5 The present invention relates to the activation of voice-controlled apparatus.

Background of the Invention

Voice control of apparatus is becoming more common and there are now well developed technologies for speech recognition particularly in contexts that only require small
10 vocabularies.

However, a problem exists where there are multiple voice-controlled apparatus in close proximity since their vocabularies are likely to overlap giving rise to the possibility of several different pieces of apparatus responding to the same voice command.

15

It is known from US 5,991,726 to provide a proximity sensor on a piece of voice-controlled industrial machinery or equipment. Activation of the machinery or equipment by voice can only be effected if a person is standing nearby. However, pieces of industrial machinery or equipment of the type being considered are generally not closely packed so
20 that whilst the proximity sensor has the effect of making voice control specific to the item concerned in that context, the same would not be true for voice controlled kitchen appliances as in the latter case the detection zones of the proximity sensors are likely to overlap.

25 One way of overcoming the problem of voice control activating multiple pieces of apparatus, is to require each voice command to be immediately preceded by speaking the name of the specific apparatus it is wished to control so that only that apparatus takes notice of the following command. This approach is not, however, user friendly and users frequently forget to follow such a command protocol, particularly when in a hurry.

30

Summary of the Invention

According to the present invention, there is provided a method of activating voice-controlled apparatus, comprising the steps of:

- 5 (a) - detecting when the user is touching the apparatus;
- (b) - detecting when the user is speaking to the apparatus;
- (c) - enabling the apparatus for voice control only if steps (a) and (b) indicate that the user has touched the apparatus just before or whilst speaking.

10 In one preferred embodiment, the apparatus, after being enabled for voice control, remains so enabled following cessation of step (a) only whilst step (b) is taking place and for a limited timeout period thereafter, recommencement of step (b) during this period continuing voice control with the timing of the timeout period being reset.

15 Advantageously, step (a) requires the user to touch an activation area of the apparatus comprising one or more zones which together occupy a substantial part of the upper part of the apparatus; this substantial part is, for example, an area at least that of an adult hand.

The present invention also encompasses apparatus embodying the foregoing method of the
20 invention.

Brief Description of the Drawings

A method and system embodying the invention, for controlling activation of voice-controlled devices, will now be described, by way of non-limiting example, with reference
25 to the accompanying diagrammatic drawings, in which:

- . Figure 1 is a diagram illustrating a room equipped with three voice-controlled devices embodying the invention;
- . Figure 2 is a diagram showing a Figure 1 device with a touch-sensitive zone along
30 its front edge; and
- . Figure 3 is a diagram showing a Figure 1 device with a touch-sensitive fabric zone on its top surface.

Best Mode of Carrying Out the Invention

Figure 1 shows a work space 11 in which a user 10 is present. Within the space 11 are three
 5 voice-controlled devices 14 (hereinafter referred to as devices A, B and C respectively)
 each with different functionality but each provided with a similar user interface subsystem
 permitting voice control of the device by the user.

More particularly, and with reference to device C, the user-interface subsystem comprises a
 10 microphone 15 feeding a speech recognition unit 17 adapted to recognise a small
 vocabulary of command words associated with the device, a touch sensor 16, and an
 activation control block 18. The output of the speech recognition unit is passed to a control
 block 20 for controlling the main functionality of the device itself (the control block can
 also receive input from other types of input controls such as mechanical switches so as to
 15 provide an alternative to the voice-controlled interface).

If the user 10 just speaks without touching touch sensor 16, the activation control block
 keeps the speech recogniser in an inhibited state and the latter therefore produces no output
 to the device control block. However, upon the user touching the sensor 16 the activation
 20 control block 18 enables the speech recognition unit to receive and interpret voice
 commands from the user. This initial enablement only exists whilst the sensor is touched,
 possibly extended for a short period (e.g. one second) after touching ceases. Only if the
 user speaks during this initial enablement phase does the activation control block 18
 continue to enable the speech recognition unit 17 after the user stops touching sensor 16;
 25 for this purpose (and as indicated by dashed arrow in Figure 1), the block 18 is fed with an
 output from the speech recogniser that simply indicates whether or not the user is speaking
 (here intended to encompass the whole range of sounds that humans can make).

When the user stops talking, the block 18 continues to enable the speech recognition unit
 30 for a limited further period (for example, 10 seconds) in case the user wishes to speak
 again to the device. If the user starts talking again in this period, the speech recogniser
 interprets the input and also indicates to block 18 that the user is speaking again; in this

When the user stops talking, the block 18 continues to enable the speech recognition unit for a limited further period (for example, 10 seconds) in case the user wishes to speak again to the device. If the user starts talking again in this period, the speech recogniser interprets the input and also indicates to block 18 that the user is speaking again; in this case, block 18 continues its enablement of unit 17 and resets its timing out of the aforesaid limited period of silence allowed following speech cessation.

In this manner, the user can easily ensure that only one device at a time is responsive to voice control.

10

With regard to the touch sensor 16 of each device 14, this sensor can be implemented using any suitable technology such as capacitive sensor, pressure sensor, resistive sensor, thermal sensor, electrostatic sensor etc; in fact, even a switch with a mechanical closing/opening action can be used. The sensor preferably has an active area comprising one or more zones which together occupy a substantial part of the upper part of the device. By substantial part is meant an area at least that of an adult human hand so as to enable a user to touch the area without having to look closely.

Indeed, the active area is advantageously chosen to be a part of the device outer surface upon which a user might naturally place their hand, such as that

- a zone along a top front edge of the apparatus (see Figure 2);
- a zone along a top side edge of the apparatus;
- a zone occupying a major part of the front third of the top of the apparatus.

In order to minimise the risk of accidental operation of the touch sensor, the sensor preferably requires for its operation a touch with at least one predetermined, non-personal, characteristic such as a minimum touch pressure in a particular direction. In this respect, the active area can be a switch plate mechanically configured to resist accidental activation by a user passing by the device rather than approaching towards the device; thus the switch plate can be arranged to pivot about an axis parallel to a top front edge of the device.

Many other variants are, of course, possible to the arrangement described above. For example, the activation control block could be arranged to enable the speech recognition unit only whilst the sensor 16 is being touched.

CLAIMS

1. A method of activating voice-controlled apparatus, comprising the steps of:
 - 5 (a) - detecting when the user is touching the apparatus;
 - (b) - detecting when the user is speaking to the apparatus;
 - (c) - enabling the apparatus for voice control only if steps (a) and (b) indicate that the user has touched the apparatus just before or whilst speaking.
- 10 2. A method according to claim 1, wherein the apparatus, after being enabled for voice control, remains so enabled following cessation of step (a) only whilst step (b) is taking place and for a limited timeout period thereafter, recommencement of step (b) during this period continuing voice control with timing of the timeout period being reset.
- 15 3. A method according to claim 1, wherein the apparatus only remains enabled for voice control whilst step (a) is being effected.
4. A method according to any one of the preceding claims, wherein step (a) requires the user to touch an activation area of the apparatus comprising one or more zones which
 - 20 together occupy a substantial part of the upper part of the apparatus.
5. A method according to claim 4, wherein said substantial part is at least the area of a hand.
- 25 6. A method according to claim 4 or claim 5, wherein said activation area comprises one or more of the following zones intended for hand contact:
 - a zone along a top front edge of the apparatus;
 - a zone along a top side edge of the apparatus;
 - a zone occupying a major part of the front third of the top of the apparatus.
- 30 7. A method according to any one of the preceding claims, wherein step (a) requires a touch with at least one predetermined non-personal characteristic.

8. A method according to claim 7, wherein said at least one predetermined characteristic is a minimum touch pressure in a particular direction.

9. A method according to claim 8, wherein said activation area is a switch plate
5 mechanically configured to resist accidental activation by a user passing by the apparatus rather than approaching towards the apparatus.

10. A method according to any one of the preceding claims, wherein step (a) involves the user stroking a particular zone of the apparatus.

ABSTRACT**Activation of Voice-Controlled Apparatus**

5

A method of activating voice-controlled apparatus (14) is provided which minimises the risk of activating more than one such apparatus at a time where multiple voice-controlled apparatus exist in close proximity. To activate the apparatus, a user (10) is required both to touch the apparatus (14) and speak at the same time. The apparatus is then activated, preferably only whilst the speaking continues and for a limited period thereafter. The touch sensitive area of the apparatus is made of substantial size in the top front part of the apparatus.

15 (Fig. 1)

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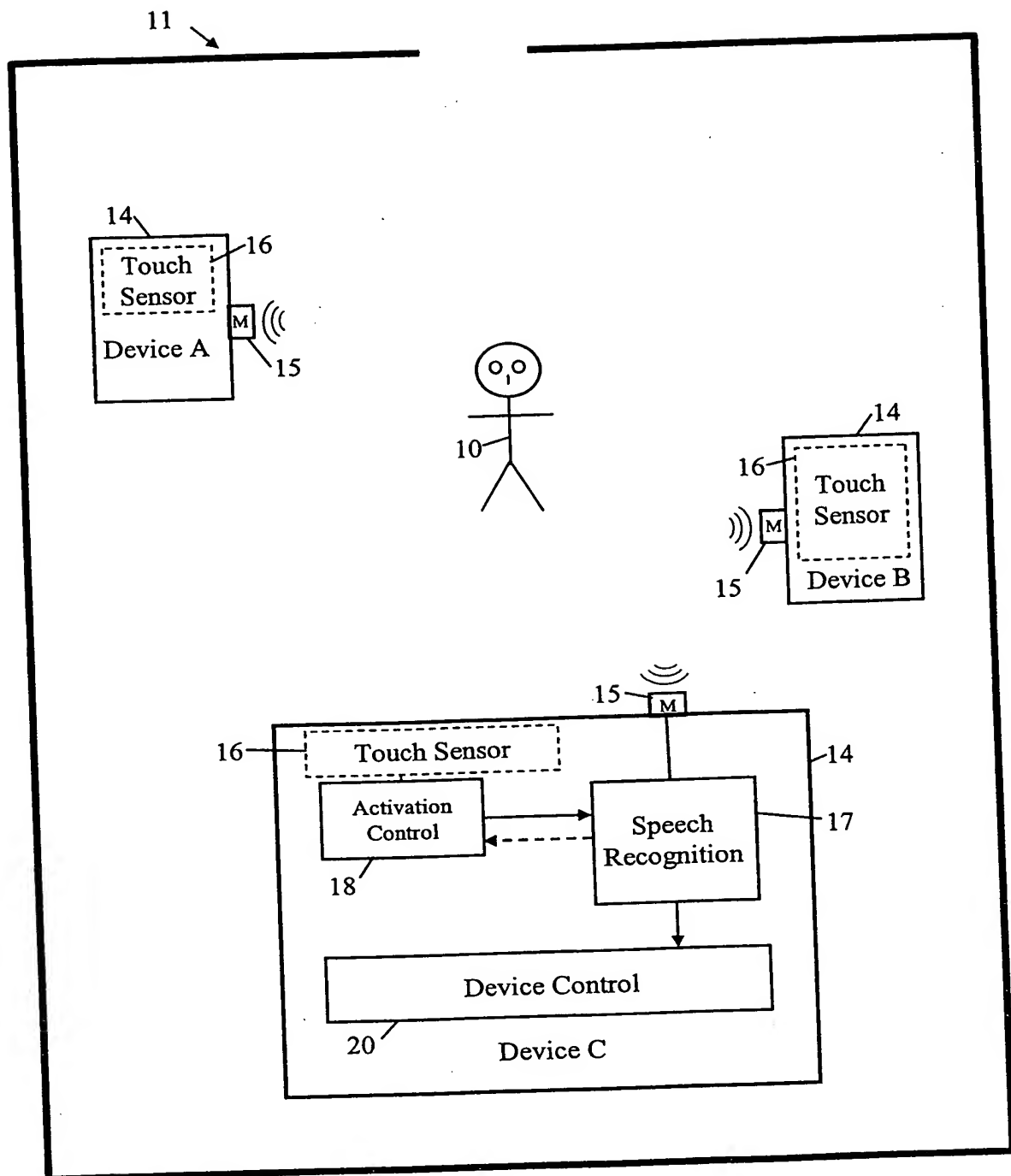


Figure 1

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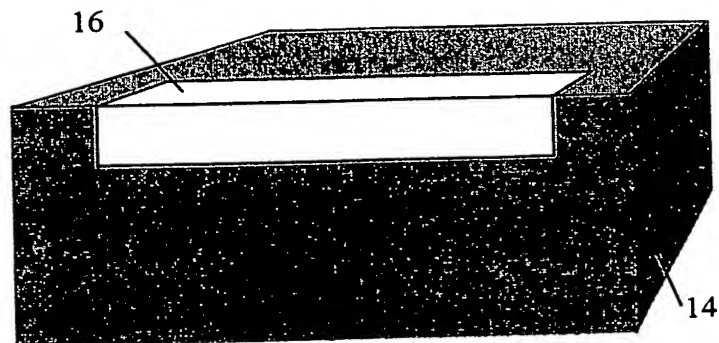


Figure 2

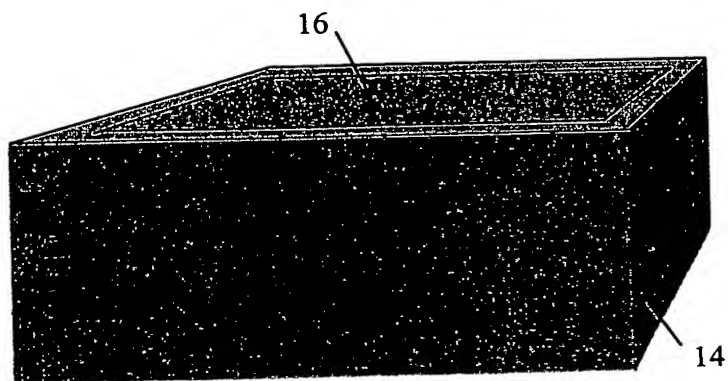


Figure 3

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